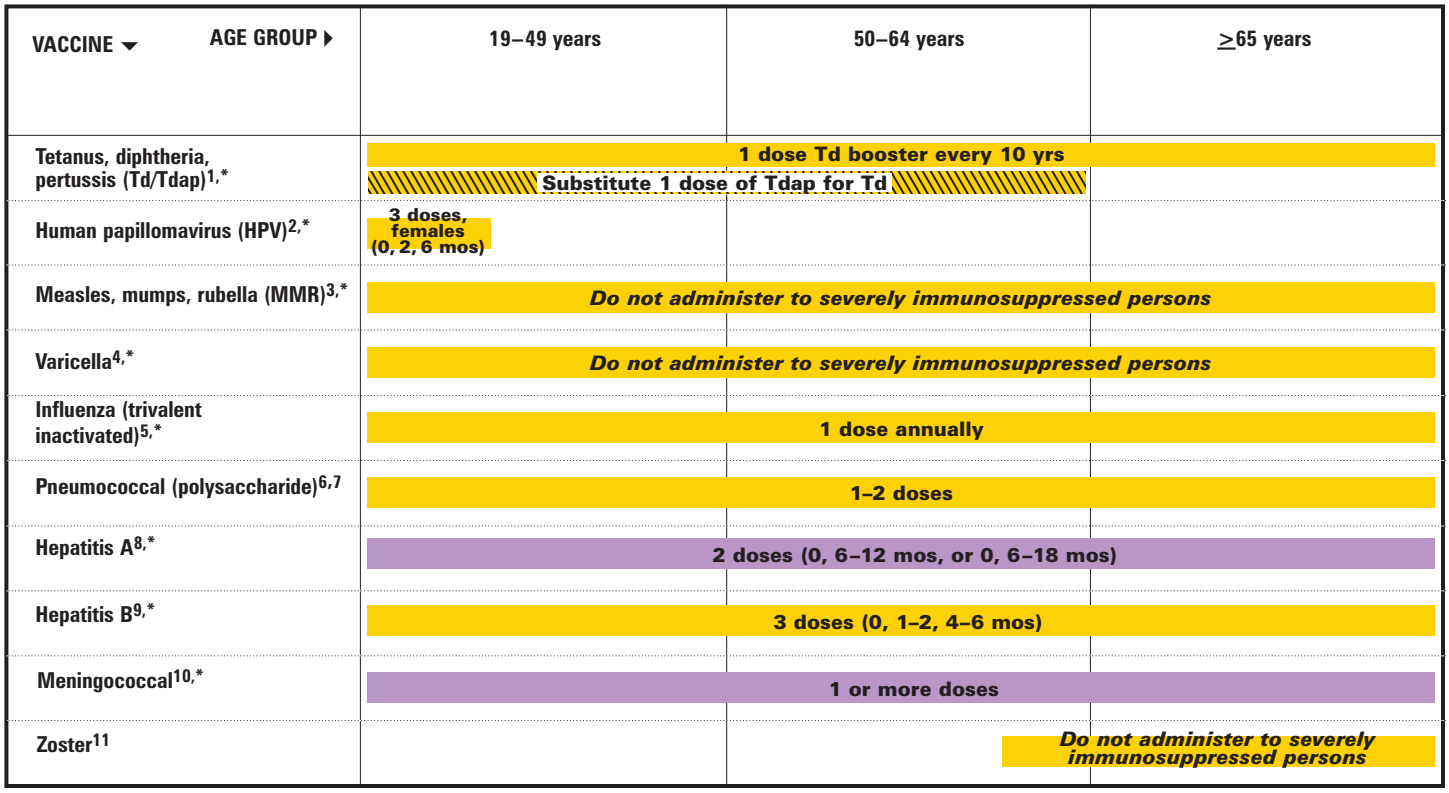
DRAFT

Recommended Immunization Schedule for Human Immunodeficiency Virus (HIV)-Infected Adults[1–12]



*Covered by the Vaccine Injury Compensation Program. NOTE: These recommendations must be read with the footnotes (see below).

For all persons in this category who meet the age requirements and/or who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

This schedule indicates the recommended age groups and indications for routine administration of currently licensed vaccines for persons aged ≥19 years, as of October 1, 2006, adapted for HIV-infected persons. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/pubs/ACIP-list.htm).

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting system (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination

Tdap should replace a single dose of Td for adults aged <65 years who have not previously received a dose of Tdap (either in the primary series, as a booster, or for wound management). Only one of two Tdap products (Adacel®[sanofi pasteur]) is licensed for use in adults.

Adults with uncertain histories of a complete primary vaccination series with diphtheria and tetanus toxoid-containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second. Administer a booster dose to adults who have completed a primary series and if the last vaccination was received ≥10 years previously. Tdap or tetanus and diphtheria (Td) vaccine may be used, as indicated.

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If the person is pregnant and received the last Td vaccination ≥10 years previously, administer Td during the second or third trimester; if the person received the last Td vaccination in <10 years, administer Tdap during the immediate postpartum period. A one-time administration of 1 dose of Tdap with an interval as short as 2 years from a previous Td vaccination is recommended for postpartum women, close contacts of infants aged <12 months, and all healthcare workers with direct patient contact. In certain situations, Td can be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be given instead of Td to a pregnant woman after an informed discussion with the woman.

Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management (www.cdc.gov/mmwr/preview/mmwr/PDF/rr/rr5517.pdf).

2. Human papillomavirus (HPV) vaccination

HPV vaccination is not specifically recommended for females with HIV infection, although, because it is not a live-virus vaccine, it can be administered. However, the immune response and vaccine efficacy might be less than that in persons who are immunocompetent.

HPV vaccination is recommended for women aged ≤26 years who have not completed the vaccine series. Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, women who are sexually active should still be vaccinated. Sexually active women who have not been infected with any of the HPV vaccine types receive the full benefit of the vaccination. Vaccination is less beneficial for women who have already been infected with one or more of the four HPV vaccine types.

A complete series consists of 3 doses. The second dose should be administered 2 months after the first dose; the third dose should be administered 6 months after the first dose.

(See www.cdc.gov/mmwr/PDF/rr/rr5602.pdf)

3. Measles, mumps, rubella (MMR) vaccination

MMR vaccination is recommended for all asymptomatic HIV-infected persons who do not have evidence of severe immunosuppression (age-specific CD4+ lymphocyte percentages of >14% or >200/μL) and for whom measles vaccination would otherwise be indicated. MMR vaccination should also be considered for all symptomatic HIV-infected persons who do not have evidence of severe immunosuppression. Withhold MMR or other measles-containing vaccines from HIV-infected persons with severe immunosuppression.

All family and other close contacts of HIV-infected persons should be vaccinated with MMR vaccine, unless they have acceptable evidence of measles immunity.

Measles component: adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥1 dose of MMR unless they have a medical contraindication., documentation of ≥1 dose, history of measles based on healthcare provider diagnosis, or laboratory evidence of immunity.

A second dose of MMR is recommended for adults who 1) have been recently exposed to measles or in an outbreak setting; 2) have been previously vaccinated with killed measles vaccine; 3) have been vaccinated with an unknown type of measles vaccine during 1963–1967; 4) are students in postsecondary educational institutions; 5) work in a healthcare facility; or 6) plan to travel internationally.

Mumps component: adults born before 1957 can generally be considered immune to mumps. Adults born during or after 1957 should receive 1 dose of MMR unless they have a medical contraindication, history of mumps based on healthcare provider diagnosis, or laboratory evidence of immunity.

A second dose of MMR is recommended for adults who 1) are in an age group that is affected during a mumps outbreak; 2) are students in postsecondary educational institutions; 3) work in a healthcare facility; or 4) plan to travel internationally. For unvaccinated healthcare workers born before 1957 who do not have other evidence of mumps immunity, consider giving 1 dose on a routine basis and strongly consider giving a second dose during an outbreak.

Rubella component: administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the healthcare facility.

(See www.cdc.gov/mmwr/preview/mmwrhtml/00053391.htm)

4. Varicella vaccination

HIV-infected adults without evidence of immunity may be considered for varicella vaccination (2 doses, 3 months apart) provided they are not severely immunocompromised, i.e., in CDC immunologic category 3. Limited data from HIV-infected children aged 1–8 years (CDC immunologic categories 1 and 2 [CD4+T-lymphocyte percentage ≥15%]) indicated that the vaccine was well-tolerated and that >80% of subjects had detectable immune response at 1 year after immunization.

Data on use of varicella vaccine in HIV-infected adolescents and adults are lacking. However, on the basis of expert opinion, the safety of varicella vaccine in HIV-infected persons aged >8 years with similar levels of immune function (CD4+ T-lymphocyte count ≥200 cells/μL) is likely to be similar to that of children aged ≤8 years. Immunogenicity might be lower in these groups compared to children 1–8 years.

(See www.cdc.gov/mmwr [in press].)

5. Influenza vaccination

Trivalent inactivated influenza vaccine is recommended for all immunosuppressed persons, including HIV-infected individuals. One dose of influenza vaccine is recommended annually. Intranasally administered live attenuated influenza vaccine (FluMist®) is contraindicated for HIV-infected persons.

Vaccination of persons who are in-home household contacts and caregivers for persons with HIV infection is also recommended. Either TIV or LAIV may be used for the household contacts and caregivers.

(See www.cdc.gov/mmwr/PDF/rr/rr5510.pdf)

6. Pneumococcal polysaccharide vaccination

Pneumococcal polysaccharide vaccine is recommended for persons with immunosuppressive conditions, including HIV infection. Vaccination should take place as close to the time of diagnosis as possible when CD4 cell counts are highest. Current vaccine should be administered in a 1-dose schedule.

(See www.cdc.gov/mmwr/preview/mmwrhtml/00047135.htm)

7. Revaccination with pneumococcal polysaccharide vaccine

One-time revaccination after 5 years for persons with immunosuppressive conditions, including HIV infection is recommended.

8. Hepatitis A vaccination

Medical indications: persons with chronic liver disease and persons who receive clotting factor concentrates.

Behavioral indications: men who have sex with men and persons who use illegal drugs.

Occupational indications: persons working with hepatitis A virus (HAV)-infected primates or with HAV in a research laboratory setting.

Other indications: persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at www.cdc.gov/travel/diseases.htm) and any person who would like to obtain immunity. Single antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6–12 months (Havrix®), or 0 and 6–18 months (Vaqta®).

(See www.cdc.gov/mmwr/PDF/rr/rr5507.pdf)

9. Hepatitis B vaccination

Hepatitis B vaccine is routinely recommended for all adults who have not completed the vaccine series, including persons with HIV infection. The vaccine series consists of 3 doses given at 0, 1–2 months, and 4–6 months.

Special formulation indications: for adult patients receiving hemodialysis and other immunocompromised adults, 1 dose of 40 μg/mL (Recombivax HB®) or 2 doses of 20 μg/mL (Engerix-B®).

Post vaccination testing is recommended for HIV-infected persons. Testing should be performed 1–2 months after administration of the last does of the vaccine series using a method that allows determination of a protective level of anti-HBs ($\geq$10mIU/mL). the need for booster doses has not been determined. Annual anti-HBs testing and booster doses when anti-HBs levels decline to $<$10 mIU/mL should be considered in persons with ongoing risk of exposure.

(See www.cdc.gov/mmwr/PDF/rr/rr5516.pdf)

10. Meningococcal vaccination

Medical indications: adults with anatomic or functional asplenia, or terminal complement component deficiencies.

Other indications: first-year college students living in dormatories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits; and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of sub-Saharan Africa during the Dry season [December–June], particularly if their contact with local populations will be prolonged. Vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj. Meningococcal conjugate vaccine is preferred for adults with any of the preceding indications who are aged $\leq$55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 5 years might be indicated for adults previously vaccinated with MPSV4 who remain at increased risk for infection (e.g., persons residing in areas in which disease is epidemic).

Patients with HIV infection are likely at increased risk for meningococcal disease, although not to the extent that they are at risk for invasive *S. pneumoniae* infection Persons with HIV infection can elect to receive MCV4 or MPSV. MCV4 is licensed for persons aged 11–55 years; persons aged $\geq$56 years should receive MPSV. For persons aged 11–55 years who have been previously vaccinated with MPSV4, revaccination with MCV4 is not indicated unless vaccination occurred 3–5 years previously and the person still remains at increased risk for meningococcal disease.

(See www.cdc.gov/mmwr/PDF/rr/rr5407.pdf)

11. Herpes Zoster vaccination

A single dose of zoster vaccine is recommended for adults $\geq$60 years of age whether or not they report a prior episode of herpes zoster. Persons with chronic medical conditions may be vaccinated unless a contraindication or precaution exists for their condition.

12. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used

Hib conjugate vaccines are licensed for children aged 6 weeks–71 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or who have had splenectomies; administering vaccine to these patients is not contraindicated.

(See www.cdc.gov/mmwr/PDF/rr/rr5515.pdf)